

REMARKS

Claims 1-22 and 45-48 are currently pending in the application, of which claims 1, 9, 16, 45, and 46 are independent. No claims are amended herein. A claim listing is included for the Examiner's convenience. Applicants respectfully urge that the pending claims are in condition for allowance.

In the Office Action:

claims 1-22 and 45-48 were rejected under 35 U.S.C. § 102(a) as being anticipated by Sauro et al., "Next Generation Simulation Tools: The Systems Biology Workbench and BioSPICE Integration," Journal of Integrative Biology, vol. 7, No. 4, 2003, p. 353-370 (hereafter "Sauro");

claims 1-5, 8-11, 14-17, 20-22, 45 and 48 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hucka et al., "The Erato Systems Biology Workbench: Enabling Interaction and Exchange Between Software Tools for Computational Biology," Pacific Symposium on Biocomputing, vol. 7, 2002, p. 450-461 (hereafter "Hucka");

claims 1-22 and 45-48 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-19, 26 and 64 of co-pending Application No. 10/783,628; and

claims 1-22 and 45-48 were provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-19, 32 and 38-39 of co-pending Application No. 10/783,552.

Applicants respectfully traverse the rejections for the reasons below.

Finality of the Office Action

The present Office Action is the first Office Action immediately after the filing of a request for continued examination (RCE) on June 8, 2009. The present Office Action is made final because the Examiner alleges that "all claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in

the next Office Action if they had been entered in the earlier application” (Office Action at page 13). The Examiner maintains the 35 USC §102 rejections in view of each of Sauro and Hucka.

However, in the amendment filed on June 8, 2009, applicants amended the claims to recite *the composite graphical model having components described by at least two different types of mathematical models*. Applicants further noted at page 9 of the response that composite models comprise “components described by multiple types of mathematical models.”

Applicants noted in the June 8 response that neither of the cited references disclose or suggest a composite graphical model *having components described by at least two different types of mathematical models* (June 8 response at pages 9-10 and 11-12). Indeed, Applicants noted at page 9 of the Response that Sauro explicitly states that the described software is capable of simulating a model including only a single type of mathematical model (Sauro at page 364, third paragraph, stating that the software is capable of simulating “either continuous (ordinary differential equation based) or probabilistic (based on Gillespie method) models”). That is, Sauro explicitly states that the described software does the opposite of what is recited in the present claims. Applicants further noted that the cited Hucka reference describes the same software as the Sauro reference, and therefore suffers from the same admitted deficiency as Sauro (June 8 Response at page 11).

Applicants respectfully urge that the amendments made to the claims and the arguments proffered in the June 8th response (to distinguish the amended claims from the cited references) should not have triggered a final rejection because the amended claims would not have been properly rejected on the grounds and art of record. Specifically, the Applicants have demonstrated in the previous response that the amended claims are distinguishable over the cited references and therefore overcome the grounds for rejection and the art of record. For at least the reasons set forth above, Applicants respectfully request that the Examiner withdraw the finality of the present Office Action.

35 U.S.C. § 102 Rejections

Rejections under Sauro

Claims 1-22 and 45-48 were rejected under 35 U.S.C. § 102(a) as being anticipated by Sauro. Applicants respectfully traverse the rejection.

Applicants respectfully urge that Sauro fails to disclose or suggest at least the following feature of claim 1: *the composite graphical model having components described by at least two different types of mathematical models and including a specified constraint provided in addition to the first and second chemical reactions that constrains dynamic behavior of the biological system*

The system of claim 1 is capable of modeling and executing composite models of a biological system. The composite model *has components described by at least two different types of mathematical models*. Composite models comprising components described by multiple types of mathematical models allow a user to model “complex real-world” systems (Specification at page 28). As noted in the Specification, a composite model may be used to describe, for example, “both metabolic and regulatory systems in the same model.”

The Examiner rejects claim 1 as being anticipated by Sauro. Applicants respectfully traverse the rejection for at least the following reasons.

First, Applicants urge that a *prima facie* case of anticipation has not been established with respect to a composite graphical model *having components described by at least two different types of mathematical model* because the Examiner has made no showing that Sauro discloses or suggests this feature. In the present Office Action, the Examiner has not alleged that Sauro discloses or suggests a *composite graphical model having components described by at least two different types of mathematical models*. Although the Examiner quotes the claim at page 3 of the Office Action, the claim feature of a *composite graphical model having components described by at least two different types of mathematical models* is not mentioned at all in the detailed response to arguments at pages 4-10 of the Office Action, except to note several times that Applicants argue that the cited references do not disclose this feature (Office Action at page 6, lines 2-3; Office Action at page 9, lines 13-15). Indeed, as discussed above with respect to the finality of the Office Action, and as discussed in Applicants’ June 8, 2009 response at pages 9-10, Sauro explicitly states that the described software is capable of simulating a model including only a single type of mathematical model (Sauro at page 364,

third paragraph, stating that the software is capable of simulating “either continuous (ordinary differential equation based) or probabilistic (based on Gillespie method) models”).

Accordingly, a prima facie case of anticipation has not been made with respect to at least the claim feature of a ***composite graphical model having components described by at least two different types of mathematical models*** because the Examiner has made no showing that the Sauro discloses or suggests this feature.

Second, Applicants respectfully urge that the Examiner misconstrues the term “composite model.” Applicants note that the Examiner indicates that he is interpreting a “composite model” to mean a model described by only a single type of mathematical model (i.e., a difference equation such as an ordinary differential equation; Office Action at page 4, lines 19-22). This directly contradicts the express language of the claims, which recite a ***composite graphical model having components described by at least two different types of mathematical models***. The Examiner’s interpretation also contradicts the ordinary meaning of the word “composite,” which according to the Random House Dictionary means “made up of disparate or separate parts or elements; compound” (Random House Dictionary 2009).

The Examiner cites the present Specification at paragraphs [0093] and [0095] as support for a composite model being a model described in “difference equations such as ODEs.” However, paragraph [0093] addresses non-composite models. The present application describes at least four different types of non-composite models. Paragraph [0093] addresses a non-composite model including only difference equations.

Paragraph [0095] provides a description of components that a composite model may include. In the Office Action, the Examiner asserts that paragraph [0095] describes a “composite model” as a model that can be represented by difference equations alone (Office Action at page 4). While paragraph [0095] does state that a composite model “has components that fall into the four types of models discussed above,” this phrase is not a definition of a composite model, but merely a description of components that a composite model may include.

Indeed, in the previous response, applicants amended claim 1 to recite a ***composite graphical model having components described by at least two different types of mathematical models***. The Examiner’s interpretation, which would define a “composite model” as a model

described by “difference equations” alone, directly contradicts the express wording of claim 1. As described in paragraph [0093], a model described by difference equations alone is a non-composite model.

Claim 9 includes *constructing, using a computing device, a composite graphical model of the biological system including the first chemical reaction and the second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models*. As noted above, Sauro fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models*, which is present in claim 9.

Claim 16 includes *constructing, using received user commands and data, a composite graphical model of a biological system including a first chemical reaction and a second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models*. As noted above, Sauro fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models*, which is present in claim 16.

Claim 45 includes *constructing a composite graphical model of the biological system including a first chemical reaction and a second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models*. As noted above, Sauro fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models*, which is present in claim 45.

Claim 46 includes *constructing a composite graphical model of the biological system comprising components described by at least two different types of mathematical models*. As noted above, Sauro fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models*, which is present in claim 46.

Thus, Sauro does not disclose or suggest all of the features of claims 9, 16, 45, and 46 for at least the reasons set forth above.

Claims 2-8 depend from and incorporate all of the features of claim 1. Thus, claims 2-8 are patentable for at least the same reasons as set forth above for claim 1. Claims 10-15 and 48

depend from and incorporate all of the features of claim 9. Thus, claims 10-15 and 48 are patentable for at least the reasons set forth above for claim 9. Claims 17-22 depend from and incorporate all of the features of claim 16. Thus, claims 17-22 are patentable for at least the reasons set forth above for claim 16. Claim 47 depends from and incorporates all of the features of claim 46. Thus, claim 47 is patentable for at least the reasons set forth above for claim 46.

Accordingly, Applicants respectfully urge the Examiner to reconsider and to withdraw the above 35 U.S.C. § 102(a) rejection of claims 1-22 and 45-48.

Rejections under Hucka

Claims 1-5, 8-11, 14-17, 20-22, 45 and 48 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hucka. Applicants respectfully traverse the rejection.

Applicants respectfully urge that Hucka fails to disclose or suggest at least the following feature of claim 1: *the composite graphical model having components described by at least two different types of mathematical models and including a specified constraint provided in addition to the first and second chemical reactions that constrains dynamic behavior of the biological system.*

The composite model in claim 1 has *components described by at least two different types of mathematical models*. A *prima facie* case of anticipation has not been made with respect to claim 1 in view of Hucka as the Examiner has made no showing that Hucka discloses or suggests a composite model that has *components described by at least two different types of mathematical models*.

Applicants urge that Hucka does not disclose or suggest this feature of claim 1. Indeed, as Applicants noted at pages 11-12 of the June 8, 2009 Response, Hucka does the opposite of what is recited in claim 1 because Hucka, like Sauro, represents models with components described by only a single type of mathematical model. Like Sauro, Hucka describes the Systems Biology Workbench (SBW) framework. As discussed above with respect to the finality of the Office Action, Hucka suffers from the same deficiency as Sauro with respect to a composite model that *comprises components described by at least two different types of mathematical models*.

Claim 9 includes *constructing, using a computing device, a composite graphical model of the biological system including the first chemical reaction and the second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models.* As noted above, Hucka fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models,* which is present in claim 9.

Claim 16 includes *constructing, using received user commands and data, a composite graphical model of a biological system including a first chemical reaction and a second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models.* As noted above, Hucka fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models,* which is present in claim 16.

Claim 45 includes *constructing a composite graphical model of the biological system including a first chemical reaction and a second chemical reaction, the composite graphical model having components described by at least two different types of mathematical models.* As noted above, Hucka fails to disclose or suggest *a composite graphical model having components described by at least two different types of mathematical models,* which is present in claim 45.

Thus, Hucka does not disclose or suggest all of the features of claims 9, 16, and 45 for at least the reasons set forth above.

Claims 2-5 and 8 depend from and incorporate all of the features of claim 1. Thus, claims 2-5 and 8 are patentable for at least the same reasons as set forth above for claim 1. Claims 10-11, 14-15, and 48 depend from and incorporate all of the features of claim 9. Thus, claims 10-11, 14-15, and 48 are patentable for at least the reasons set forth above for claim 9. Claims 17 and 20-22 depend from and incorporate all of the features of claim 16. Thus, claims 17 and 20-22 are patentable for at least the reasons set forth above for claim 16.

Accordingly, Applicants respectfully urge the Examiner to reconsider and to withdraw the above 35 U.S.C. § 102(a) rejection of claims 1-5, 8-11, 14-17, 20-22, 45 and 48.

Double Patenting Rejections

In the Office Action, the Examiner has provisionally rejected claims 1-22 and 45-48 on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-19, 26 and 64 of co-pending United States Patent Application Number 10/783,628 (Attorney Docket No. MWS-108). Since the rejection is provisional, Applicants will submit a terminal disclaimer, if necessary, when the pending claims are deemed allowable.

In the Office Action, the Examiner has further provisionally rejected claims 1-22 and 45-48 on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-19, 32 and 38-39 of co-pending United States Patent Application Number 10/783,552 (Attorney Docket No. MWS-109). Since the rejection is provisional, Applicants will submit a terminal disclaimer, if necessary, when the pending claims are deemed allowable.

CONCLUSION

In view of the above, Applicants urge that the pending application is in condition for allowance. Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants' attorney at (617) 227-7400.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-110RCE2. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. §1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

Dated: October 19, 2009

Respectfully submitted,

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